CLAIMS

The invention claimed is:

1. An gas mover system for a gas depolarized cell or battery of cells comprising:

a casing to contain the cell or battery of cells;

at least one ventilation passageway extending through the casing to a gas supply; and

a resilient reciprocating diaphragm movable in a first direction by an electromagnetic field and in a second direction by the resiliency of the diaphragm operative to cause gas to move from the gas supply to the interior of the casing adjacent to a gas electrode of said cell and from the interior adjacent to a gas electrode of said cell to the exterior of the casing.

2. The system of Claim 1, wherein the gas depolarized cell is a metal-air cell.

3. The system of Claim 1, wherein the gas depolarized cell is a fuel cell.

4. A system for manipulating a diaphragm air mover comprising:

a resilient ferromagnetic diaphragm having two sides;

a coil positioned in proximity to said diaphragm, said coil operative to attract the resilient ferromagnetic diaphragm and thus move said diaphragm when an electrical current passes through the coil; and

whereby the resiliency of said diaphragm returns said diaphragm to the original position when an electrical current no longer passes through said coil.

5. The system of Claim 4, wherein the resilient ferromagnetic diaphragm comprises a resilient diaphragm with a ferromagnetic plate attached to one side.

6. The system of Claim 4, wherein the resilient ferromagnetic diaphragm is formed from a resilient ferromagnetic material.

7. A system for controlling the manipulation of a diaphragm air mover comprising:

a resilient ferromagnetic diaphragm having two sides;

a coil positioned in proximity to said diaphragm;

an electrical circuit having an electrical current source and directing electrical current through the coil thus creating an electromagnetic magnetic field operative to attract said diaphragm and cause said diaphragm to move when a predetermined level of electrical current passes through said coil; and

a pair of contacts in said circuit, one of said contacts being connected to said diaphragm, and said contacts being closed when current flow through said coil is less than said predetermined level such that the presence of current flow through said coil greater than said predetermined level moves the diaphragm, breaking the circuit, de-energizing the coil, and allowing the resiliency of the said diaphragm to return said diaphragm to the original position and remaking the circuit.

8. The system of Claim 7, wherein the resilient ferromagnetic diaphragm comprises a resilient diaphragm with a ferromagnetic plate attached to one side.

9. The system of Claim 7, wherein the resilient ferromagnetic diaphragm is formed of a resilient ferromagnetic material.

10. The system of Claim 7, wherein the electrical circuit is reestablished when the contacts are closed after the resilient ferromagnetic diaphragm has returned to its original position thus recreating an electromagnetic magnetic field

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operative to attract said resilient ferromagnetic diaphragm and causing the oscillation of said resilient ferromagnetic diaphragm while the electrical current available to said coil is greater than said predetermined level.

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11. A method for moving air in an gas depolarized cell or battery of cells comprising:

encasing the cell or battery of cells in a body having at least one ventilation passageway extending through the body;

reciprocating a resilient diaphragm contained within the interior of said body in a first direction by an electromagnetic field and in a second direction by the resiliency of the diaphragm;

whereby moving air from the exterior to the interior of said body adjacent to an air electrode of said cell and from the interior adjacent to an air electrode of said cell to the exterior of said body.

12. The system of Claim 11, wherein the gas depolarized cell is comprised of a metal-air cell.

13. The system of Claim 11, wherein the gas depolarized cell is comprised of a fuel cell.

14. A method for manipulating a diaphragm air mover comprising:

positioning a coil in proximity to a resilient ferromagnetic diaphragm, said coil operative to attract the diaphragm;

moving said diaphragm when an electrical current passes through the coil; and

whereby the resiliency of said diaphragm returns said diaphragm to the original position when the electrical current no longer passes through said coil.

15. The method of Claim 14, wherein the resilient ferromagnetic diaphragm comprises a resilient diaphragm with a ferromagnetic plate attached to one side.

16. The method of Claim 14, wherein the resilient ferromagnetic diaphragm is formed of a resilient ferromagnetic material.

17. A method for controlling the manipulation of a diaphragm air mover comprising the steps of:

positioning a coil in proximity to a resilient ferromagnetic diaphragm, said resilient ferromagnetic diaphragm having two sides;

providing an electrical circuit having an electrical current source;

directing electrical current from said electrical current source through the coil thus creating an electromagnetic magnetic field operative to attract said diaphragm and cause said diaphragm to move when a predetermined level of electrical current passes through said coil;

providing a pair of contacts in said circuit, one of said contacts being connected to said diaphragm, and said contacts being closed when current flow through said coil is less than said predetermined level; and

moving said diaphragm when the presence of current flow through said coil is greater than said predetermined level thus breaking the circuit, de-energizing the coil, and allowing the resiliency of the said diaphragm to return said diaphragm to the original position and remaking the circuit.

18. The method of Claim 17, wherein the resilient ferromagnetic diaphragm comprises a resilient diaphragm with a ferromagnetic plate attached to one side.

19. The method of Claim 17, wherein the resilient ferromagnetic diaphragm is formed of a resilient ferromagnetic material.

20. The method of Claim 17, wherein the electrical circuit is reestablished when the contacts are closed after the resilient ferromagnetic diaphragm has returned to its original position thus recreating an electromagnetic magnetic field operative to attract said resilient ferromagnetic diaphragm and causing the oscillation of said resilient ferromagnetic diaphragm while the electrical current available to said coil is greater than said predetermined level.

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21. An a gas supply mover system for an gas depolarized power supply associated with a load having at least two modes of operation drawing different levels of current from the power supply, comprising:

a casing containing one or more gas depolarized cells;

at least one ventilation passageway extending through the casing ;

an a gas supply mover positioned to move air from the exterior to the interior of said casing adjacent to an a gas supply electrode of the cell and from the interior adjacent to an a gas supply electrode of said cell to the exterior of said casing;

said passageway permitting a predetermined low flow rate of air from the exterior to the interior of said casing adjacent to an gas supply electrode of said cell during a low current draw mode of operation of the load while the gas supply mover is inoperative; and

said gas supply mover becoming operative responsive to initiation of a high current draw mode of operation of said load.

22. The system of Claim 21, wherein the gas depolarized cell is comprised of a metal-air cell.

23. The system of Claim 21, wherein the gas depolarized cell is comprised of a fuel cell.

24. The system of Claim 21, wherein the gas supply is O2 gas in air.

25. The air mover system of Claim 21 wherein the operation of the air mover is controlled by a controller configured to:

monitor load on the gas depolarized power supply;

determine if the load corresponds to a high current draw mode of operation; and

operate the air mover if said load corresponds to the high current draw mode of operation.

26. The air mover system of Claim 21 wherein the air mover is an electric air pump controlled by a controller configured to:

restrict current to the electric air pump to a magnitude sufficient not to operate said electric air pump during a low current draw mode of operation; and

direct a magnitude of current to said electric air pump sufficient to operate said electric air pump during a high current draw mode of operation.

27. The air mover system of Claim 21 wherein the air mover comprises:

a resilient ferromagnetic diaphragm having two sides;

a coil positioned in proximity to said diaphragm;

an electrical circuit having an electrical current source and directing electrical current through the coil thus creating an electromagnetic magnetic field operative to attract said diaphragm and cause said diaphragm to move when a predetermined level of electrical current passes through said coil; and

a pair of contacts in said circuit, one of said contacts being connected to said diaphragm, and said contacts being closed when current flow through said coil is less than said predetermined level such that the presence of current flow through said coil greater than said predetermined level moves the diaphragm, breaking the circuit, de-energizing the coil, and allowing the resiliency of the said diaphragm to return said diaphragm to the original position and remaking the circuit.

28. The system of Claim 27, wherein the electrical circuit is reestablished when the contacts are closed after the resilient ferromagnetic diaphragm has returned to its original position thus recreating an electromagnetic magnetic field operative to attract said resilient ferromagnetic diaphragm and causing the oscillation of said resilient ferromagnetic diaphragm while the electrical current available to said coil is greater than said predetermined level.

29. The air mover system of Claim 21 where the air mover is a fan.

30. The air mover system of Claim 21 where the air mover is a resilient reciprocating diaphragm movable in a first direction by an electromagnetic field and in a second direction by the resiliency of the diaphragm.

31. The air mover system of Claim 21 where the air mover is powered by electric energy supplied by the power supply.

32. The air mover system of Claim 21 where the system is utilized in a cellular telephone, the low current draw mode of operation being the stand-by mode of the cellular telephone and the high current draw mode of operation being the transmit/receive mode of said cellular telephone.

33. A method of admitting air to an gas depolarized power supply associated with a load having at least two modes of operation drawing different levels of current from the power supply, comprising the steps of:

enclosing one or more gas depolarized cells in a casing with at least one ventilation passageway extending through the casing;

initiating the operation of an air mover, positioned to move air from the exterior to the interior of said casing adjacent to an air electrode of the cell and from the interior adjacent to an air electrode of the cell to the exterior of said casing, responsive to the initiation of a high current draw mode of operation of the load; and

terminating the operation of said air mover during a low current draw mode of operation of said load, the ventilation passageway permitting a predetermined low flow rate of air from the exterior to the interior of said casing adjacent to an air electrode of said cell while said air mover is inoperative.

34. The system of Claim 33, wherein the gas depolarized cell is comprised of a metal-air cell.

35. The system of Claim 33, wherein the gas depolarized cell is comprised of a fuel cell.

36. The method of Claim 33, further comprising the steps of:

monitoring load on the gas depolarized power supply;

determining if the load corresponds to a high current draw mode of operation; and

operating the air mover if said load corresponds to a high current draw mode of operation.

37. The method of Claim 33, further comprising the steps of:

utilizing an electric air pump as the air mover;

restricting current to the electric air pump to a magnitude sufficient not to operate said electric air pump during a low current draw mode of operation; and

directing a magnitude of current to said electric air pump sufficient to operate said electric air pump during a high current draw mode of operation.

38. The method of Claim 33 wherein the load on the metal-air power supply is a cellular telephone having a stand-by mode and a transmit/receive mode, said stand-by mode corresponding to said low current draw mode and said transmit/receive mode corresponding to said high current draw mode.

39. The method of claim 33, wherein the air mover comprises a resilient ferromagnetic diaphragm and wherein controlling the manipulation of the resilient ferromagnetic diaphragm comprising the steps of:

positioning a coil in proximity to the resilient ferromagnetic diaphragm, said resilient ferromagnetic diaphragm having two sides;

providing an electrical circuit having an electrical current source;

directing electrical current from said electrical current source through the coil thus creating an electromagnetic magnetic field operative to attract said diaphragm and cause said diaphragm to move when a predetermined level of electrical current passes through said coil;

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providing a pair of contacts in said circuit, one of said contacts being connected to said diaphragm, and said contacts being closed when current flow through said coil is less than said predetermined level; and

moving said diaphragm when the presence of current flow through said coil is greater than said predetermined level thus breaking the circuit, de-energizing the coil, and allowing the resiliency of the said diaphragm to return said diaphragm to the original position and remaking the circuit.

40. The method of Claim 39, wherein the electrical circuit is reestablished when the contacts are closed after the resilient ferromagnetic diaphragm has returned to its original position thus recreating an electromagnetic magnetic field operative to attract said resilient ferromagnetic diaphragm and causing the oscillation of said resilient ferromagnetic diaphragm while the electrical current available to said coil is greater than said predetermined level.

41. An air mover system for an gas depolarized cell or battery of cells, said gas depolarized cell or battery of cells to provide energy for an electrical device, said air moving system comprising:

a casing removable from the electrical device, said casing to contain the cell or battery of cells;

at least one ventilation passageway extending through the casing, said ventilation passageway mateably connected to said electrical device; and

a resilient reciprocating diaphragm contained in said electrical device, said resilient reciprocating diaphragm movable in a first direction by an electromagnetic field and in a second direction by the resiliency of the diaphragm operative to cause air to move through said ventilation passageway from the exterior to the interior of the casing adjacent to an air electrode of said cell and from the interior adjacent to the air electrode of said cell to the exterior of the casing.

42. The system of Claim 41, wherein the gas depolarized cell is comprised of a metal-air cell.

43. The system of Claim 41, wherein the gas depolarized cell is comprised of a fuel cell.

44. A system for manipulating a diaphragm gas mover comprising:

a electrically activated diaphragm;

an electric current source operative to pass an electrical current through the electrically activated diaphragm thus deforming and causing the movement of said electrically activated diaphragm when an electrical current passes through said electrically activated diaphragm; and

whereby said electrically activated diaphragm returns to the original position when an electrical current no longer passes through said electrically activated diaphragm.

45. The system of Claim 44, wherein the electrically activated diaphragm is comprised of a piezoelectric material.

46. The system of Claim 44, wherein the electrically activated diaphragm comprises a resilient diaphragm with a strip of a piezoelectric material attached to one side.

47. The system of Claim 44, wherein the electrically activated diaphragm is comprised of an electrostatic material.

48. The system of Claim 44, wherein the electrically activated diaphragm comprises a resilient diaphragm with a strip of an electrostatic material attached to one side.

49. A system for controlling the manipulation of a diaphragm gas mover comprising:

an electrically activated diaphragm having two sides;

an electrical circuit having an electrical current source and directing electrical current through the electrically activated diaphragm operative to deform said diaphragm and cause said diaphragm to move when a predetermined level of electrical current passes through said electrically activated diaphragm; and

a pair of contacts in said circuit, one of said contacts being connected to said electrically activated diaphragm, and said contacts being closed when current flow through said electrically activated diaphragm is less than said predetermined level such that the presence of current flow through said electrically activated diaphragm greater than said predetermined level deforms said electrically activated diaphragm causing said electrically activated diaphragm to move, breaking the circuit, de-energizing the current through said electrically activated diaphragm, and allowing said electrically activated diaphragm to return to the original position and remaking the circuit.

50. The system of Claim 49, wherein the electrically activated diaphragm is comprised of a piezoelectric material.

51. The system of Claim 49, wherein the electrically activated diaphragm comprises a resilient diaphragm with a strip of a piezoelectric material attached to one side.

52. The system of Claim 49, wherein the electrically activated diaphragm is comprised of an electrostatic material.

53. The system of Claim 49, wherein the electrically activated diaphragm comprises a resilient diaphragm with a strip of an electrostatic material attached to one side.

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